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Editor:

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HONORARY VETERINARY SURGEON TO HIS MAJESTY THE KING.

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Biography

DR. SCHMIDT, VETERINARY SURGEON, OF KOLDING

THE subject of our frontispiece needs no introduction to our readers as the pioneer of the work which he has done has made his name famous throughout the whole veterinary and agricultural world. It is on account of his having recently completed the fiftieth anniversary since taking his diploma that we again wish to do him honour. We are sure that his English colleagues will join in sending him the heartiest of congratulations and the hope that he may be spared yet for many years to see and enjoy the fruits of his work.

What Schmidt has unselfishly done for the treatment of milk fever alone must have saved the agriculturists of every country of the civilised world many hundreds of thousands of pounds, and his colleagues in the veterinary profession many hours of anxiety. To treat milk fever nowadays is a pleasure, and instead of having about 75 per cent. of fatalities, one can rest assured of over 95 per cent. of cures, if only one gets called to the case in time.

Born in 1845, Dr. Schmidt took his veterinary diploma at Copenhagen in 1872, and eventually settled down at Kolding. As a clinician he soon distinguished himself, and by his carefully recorded observations speedily made himself a name amongst his veterinary colleagues as a skilful practitioner.

He was a pioneer of the idea that farmers should have their cattle examined at least once a year by a veterinary surgeon as a

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preventive against the spread of tuberculosis; the suspected animals being isolated and disposed of by fattening or otherwise.

His researches into the study of milk fever were first published in 1897, and it is not an exaggeration to say that the numbers of lives of milking-cattle which have been saved by his treatment alone can be counted by the hundreds of thousands.

The King of Denmark has decorated him as a Knight of the Order of Danebroge, and he was awarded a special vote of thanks together with an annual sum of money by the Danish Parliament. Honours have been heaped upon him from foreign countries, and, although he is now 78 years of age, he still takes as much interest as ever in the welfare of his beloved profession.

Editorials

BUSINESS METHODS IN PRACTICE

PROFESSIONAL men as a class are probably the worst business men in the world, and in these days of strenuous competition, high taxation, and increased cost of the necessaries of life, it is necessary that even they shall turn to business methods. A paper which we abstract from an American contemporary, and which we publish in this issue, is one which merits close perusal by our colleagues in this country.

The business instinct of the American has become a byword and in some respects deserves some imitation.

The veterinary surgeon in private practice has many more expenses than his medical colleague, especially if he is located in a country district, for his professional round is a wide one, and since the advent of the motor traction, and owing to the consequent disappearance of the horse, he has had to travel over a very much larger area in order to obtain a livelihood. Of late years his expenses have more than doubled; his drug bill, always a serious item, needs looking into, and where substitutes of equal value can be found, they must be resorted to.

In the old days it was his pride to keep a large establishment and to include a number of hospital boxes for the larger animals; this meant increased rent and space, together with a capital outlay for food and provender, and the wages of men to attend to infirmary animals.

Nowadays, except in certain special instances, this cannot be made to pay, and if a man has been unfortunate enough to be saddled with expensive premises it is necessary that he shall con-

vert them into garage room or utilise them for other purposes. Even the owner of a large canine hospital finds that it pays him better to limit his hospital kennel accommodation.

There is no doubt that our profession is passing through a serious crisis, and that it is necessary for its members to readapt themselves to the altered circumstances. A perusal of the paper on "Business Methods in a Country Practice," by our American colleague, Mr. E. B. Moore, of Cortland, New York State, to be found in this month's issue, will well repay the time spent on it.

VETERINARY RESEARCH IN AUSTRALIA

ACCORDING to information received a short time ago, the Veterinary Faculty of the University of Melbourne has received the sum of £2,500 for the promotion of veterinary research. This handsome gift is from Sir John Huggins, the Chairman of "Bawra" (British Australian Wool Realisation Association), who has given £5,000 (half his annual salary) to charitable and other institutions.

He also did a similar thing in 1921. Would that we in Great Britain had similar benefactors!

Original Article

NOTE ON HELMINTHS COMMON TO MAN AND DOMESTICATED ANIMALS

BY R. DAUBNEY, M.Sc., M.R.C.V.S.,
Ministry of Agriculture and Fisheries.

THE following notes on the species of worms common to man and the domesticated animals are published at the request of the editor of the VETERINARY JOURNAL, with the idea they may assist in showing how closely related are the problems of medical and veterinary research workers in this field.

Although some species of parasitic worms have a more or less extended range of hosts, most species are more exacting in their host requirements, and accordingly they cannot be transmitted to experimental animals in the manner employed when dealing with pathogenic bacteria. This fact at once places difficulties in the way of experimental investigation of the life-cycle of many human parasites, unless the worker is willing to act as experimental host himself, a not uncommon occurrence in this field. Elucidation by experimental methods of the life-cycle of a species parasitic in man is often a rapid sequel to the discovery that domesticated animals or small rodents can, or do, act as hosts of the species in question. Actual instances

of this are numerous, e.g. *Schistosoma japonicum, Clonorchis sinensis, Fasciolopsis buskii*, etc.

Where man and a domesticated animal act in common as definitive host of a species, the true natural host may be either man (e.g. *Ascarus lumbricoides*) or the domesticated animal (e.g. *F. hepatica*). In the case of *Ascaris lumbricoides* the greater size attained by this species in man indicates man as the true natural host, although in this country the parasite is far more frequently encountered in the pig. The bearing of such cases upon any measures separately evolved for the control of the parasite in either of its hosts is too obvious to require comment. Another case in point is that of the parasite which employs man as host in one phase of its life-cycle and a domesticated animal in another; thus man commonly acts as intermediary host for *Echinococcus*, a parasite of the dog, while on the other hand cattle and pigs harbour the intermediary stages of *Tænia saginata* and *T. solium*, the former the common tapeworm of man in this country.

Two other points outside the scope of this paper might perhaps be mentioned here. Different species of the same genus frequently occur, the one species in man and the other or others in domesticated animals. In such cases the elucidation of the life-history of one species furnishes a line to be followed in work upon the other species. The liver fluke of sheep (*Fasciola hepatica*) will serve as an illustration here.

Lastly, there is the question of research in anthelmintic treatment. Many drugs have acquired fallacious reputations as anthelmintics on the reports of sketchy observations. An animal or a man is given a drug as an anthelmintic, and if some worms are passed the treatment is considered successful, particularly if it is followed by an improvement in the condition of the patient. It is, however, impossible to estimate the anthelmintic properties of a drug without careful and arduous experiments involving the use of a large number of experimental animals, some of which may be accidentally killed during the experiments. The work of Hall and others in America in recent years is an excellent illustration of how such experiments must be conducted to ensure reliable results. Hall's experiences with oil of chenopodium, chloroform, and latterly carbon tetrachloride, in the treatment of hook-worm in dogs have had a profound effect throughout the world on the treatment of hook-worm in man.

I. TREMATODA.

Superfamily. **Paramphistomoidea,** Stiles and Goldberger, 1910.
Family. GASTRODISCIIDÆ, Stiles and Goldberger, 1910.
Subfamily. *Gastrodiscus hominis* Lewis and McConnell, 1876.

Synonyms: *Amphistoma hominis* Lewis and McConnell, 1876; *A. (Gastrodiscus) hominis* Sonsino, 1895; *Gastrodiscus hominis* Sonsino, 1896; *Gastrodiscoides hominis* Leiper, 1913.

This fluke was discovered by Lewis and McConnell in 1876 in the cæcum of a man. It has since been recorded from India and Assam. According to Khalil (1922), its range is restricted to the Malay States, Assam, Cochin-China and India. Cases recorded from other parts of the world (e.g. Low's case in Guiana), have been traced to emigrants. Brau and Bruyant (1913), in a survey of the parasites of pigs in Cochin-China recorded its occurrence in 5 per cent. of the animals examined. They report the finding of extremely small forms in some localities. The incidence observed by Brau and Bruyant suggests that the pig is the natural host. Khalil (1922) has reported the occurrence of this parasite in the cæcum of a Napu mouse deer (*Tragulus napu*) in the Zoological Gardens, London.

Leiper (1913) proposed the genus *Gastrodiscoides*, with this species as type. The validity of *Gastrodiscoides* is still a subject of controversy. A second species *Gastrodiscoides minor* from pigs in Nigeria and Uganda was described by Leiper in the same paper. No pathogenic effects have been recorded as due to the presence of this species, but recently Nainsouta (1921) has described cases of peritonitis in horses due to perforation of the gut in heavy infestation with *Gastrodiscus ægyptiacus*.

Hosts.—Pig, man, Napu mouse deer (*Tragulus napu*).

Life History.—Unknown.

Superfamily. **Fascioloidea,** Stiles and Goldberger, 1910
Family. FASCIOLIDÆ, Railliet, 1895.
Subfamily. *Fasciolinæ*, Stiles and Hassall, 1898.
Fasciola hepatica Linn., 1758.

Synonyms: *Distomum hepaticum* Retz., 1786; *Fasciola humana* Gmelin, 1789; *Distomum caviæ* Sonsino, 1890; *Cladocœlium hepaticum* Stoss., 1892.

The common liver fluke of sheep is a parasite of considerable economic importance. Its distribution is world-wide. It is annually responsible for the deaths of large numbers of sheep, and under certain conditions the losses from liver fluke occasionally become enormous. Epizoötics have been recognised periodically since the middle of the sixteenth century, when the disease was described by Gesner (1551), Gemma (1575), and Gabucinius (1597). In Great Britain the mortality among sheep was estimated to have been 3,000,000 annually during the years 1879 and 1880, and exceedingly heavy losses were incurred as

recently as the 1920-21 season. In man *Fasciola hepatica* is rarely recorded. Kuchenmeister (1857) quotes Mehlis as authority for eight cases, observed by Malpighi, Chabert, Bauhin, Biddloo, Wepfer, Pallas, Brera, and Mehlis himself. According to Bremser, however, Bauhin's parasites were not *F. hepatica*, while Kuchenmeister doubted the authenticity of Mehlis's case. Cobbold (1879) considers to be spurious also the cases alleged by Wepfer and Chabert. Budd (1852) mentions a case at the Middlesex Hospital where a single specimen was found in the gall bladder. Biermer (1865) records the finding of one specimen in the course of a post-mortem examination. Prunac (1878) cites a case in which a woman patient expelled *per anum* between fifty and sixty flukes. During the epizoötic of 1879-81 in this country Humble and Lush (1881) reported the death of a labourer at Corfe Castle from "liver-rot." In the case of an English soldier in Egypt, Chester (1885) records *F. hepatica* as the cause of death. Duffek (1902) has also recorded a fatal case in a young woman in Austria. More recently four cases in which the presence of the parasite was diagnosed by the finding of eggs in the fæces have been communicated, two by Lavergne (1916) and (1918), one by Guiart (1920), and one by Vogel (1922). Romera Sierra (1918) has reported the finding of an adult liver fluke in the duodenum of a male cadaver in Venezuela. Other cases recorded include those of Lambl (1859), Wyss (1868), Bostroem (1883), Garcia Sola (1884), and Sagarra (1890).

Aberrant parasites have not been reported as frequently as those in the liver and gall ducts. According to M. Braun (1903), *Hexathyridium venarum* (Treutler, 1793) was most probably an immature liver fluke. Adults were found by Duval (1842) in the portal vein and other veins post-mortem at Rennes, and a similar case was reported by Vital (1874) from Constantine. Giesker (1850) found two flukes in a swelling on the sole of a woman's foot. Penn Harris's case, fully recorded by Lankester (1857), in which some six or seven mature flukes are supposed to have been taken from an abscess of the occiput of a two-year-old child, is not sufficiently substantiated as to the actual source of the specimens; a second case, in which flukes were taken from an abscess behind the ear, is also reported by Lankester (*loc. cit.*). Dionis de Carrières records a case in which a young liver fluke was taken from a tumour in the right hypochondriac region of a man. Max Braun considers it possible that *Distomum ophthalmobium*, Diesing, 1850, and *Monostomum lentis*, von Nordmann, 1832 (the former from between the opaque lens or capsule of a five-months-old child, and the latter from the opaque lens of an old woman), may have been immature liver flukes. Khouri (1904) records the occurrence of an unusual type of parasitism in man in North Lebanon. Adult flukes from the livers

of goats are transferred to man and become reattached to the mucous membrane in the bucco-pharyngeal region. Livers of young goats are commonly eaten uncooked in this district, and it is in this manner that the transference of the flukes is effected. Only a proportion of the flukes taken in survives to reattach in this curious manner, the remainder being destroyed during mastication or swallowed and digested. Those which escape attach themselves to the mucous membrane of the pharynx, larynx, Eustachian tubes, and adjoining parts, producing symptoms of dysphagia, dyspnœa, disphonia, very occasionally resulting in death. The affection usually lasts but a few hours, and is terminated by the removal of the parasites during emesis.

Hosts.—Sheep, cattle, goats, duiker, antelope, horse, ass, rabbit, pig, cat, man, beaver (*castor*), kangaroos and wallabies.

Hosts, Intermediate.—Limnæa truncatula, L., throughout Europe and Siberia, Asia Minor, Thibet. *L. oahuensis*, Souleyet, and *L. rubella*, Lea, in the Sandwich and Hawaiian Islands. *L. tenuistriatus* in Australia. *Isidora tropica* and *Limnæa natalensis* in South Africa, Porter, 1921. *Ampullaria luteostoma* in Venezuela (Iturbe). Possibly *Limnæa viator*, Orb., in South America, and *L. humilis*, Say, or *Physa fontinalis* in North America.

Reference should be made to the work of Ssinitsîn (1914). This observer found that in cases of experimental infestation induced by feeding encysted cercariæ to rabbits, the young flukes reached the peritoneal cavity by perforating the intestinal wall. After a stay of from three to fourteen days in the peritoneal cavity they enter the liver by directly penetrating the capsule. These findings were amply confirmed by the pathological observations of Frenkel (1919), and by the writer's own observations in Wales during the season 1920-21. In the case of the Welsh outbreak the local conditions were such that the sheep on being brought down to lowland pastures in the late autumn received a very heavy initial infestation, frequently resulting in death during the stage of migration of the parasites. In such cases the loss of blood from the ruptures of the surface of the liver was enormous, and although small flukes were to be found in the substance of the liver beneath the capsule, the bile ducts contained no large flukes.

Fasciola gigantica Cobbold, 1855.

Synonyms : *F. gigantea* Diesing, 1858 ; *Cladocœlium giganteum* Stoss., 1892 ; *Fasciola hepatica angusta* Raill., 1895 ; *F. ægyptiaca* Looss, 1896 ; *F. hepatica ægyptica* Looss, 1896, Stiles, 1898.

XUM

This is the common cattle fluke of Africa. It was originally described by Cobbold (1855) from *Giraffa cameleopardalis*. It is commonly found in the gall bladder and bile ducts of cattle, buffalo, zebu, sheep, and goats. It is readily distinguished from *Fasciola hepatica* by its elongated body of characteristic shape, the anterior position of the large ventral sucker and its larger eggs. Railliet places De Gouvea's (1895) case here. De Gouvea recorded the case of a French officer who, after a period of illness characterised by fever, cough, and slight blood-spitting, coughed up a fluke about one inch long. The patient had spent some time in Dakar where *F. gigantica* is common in slaughter-house animals. The description of the parasite, in which De Gouvea refers to its slender form, the size of the ventral sucker and its proximity to the oral sucker, suggests that this was a specimen of *F. gigantica*. A second case in man has been recorded by Musgrave (1907).

Hosts.—Cattle, buffalo, zebu, sheep, goats, giraffe, man.

Life History.—According to Porter (1921) the life history is similar to that of *F. hepatica*, the intermediate host in South Africa being *Limnæa natalensis*.

FASCIOLOPSINÆ, Odhner, 1910.

Fasciolopsis buskii Lank., 1857.

Synonyms: *Distoma buskii* Lank., 1857. *D. crassum* Busk, 1859; Cobb, 1860 [*nec.* Cobbold of Leidy, 1891; *nec.* von Siebold, 1836; *nec.* Olss., 1876]. *D. rathouisi*, Poirier, 1887. *Fasciolopsis ulleborni*, Rodenwaldt, 1909. *F. goddardi*, Ward, 1910. *F. spinifera*, Brown, 1917; Kwan's fluke.

Hosts.—Pig, man, dog (experimentally).

According to Heanly (1908), Mathis and Leger (1911), and Bauche, *Fasciolopsis buskii* is an extremely common parasite in the stomach and small intestines of pigs in China. Previous to the work of Barrois and Noc (1908) in Cochin-China, there were only some seven cases of infection in man with *F. buskii* on record. In the course of a systematic examination at Saigon of the fæces of natives treated with thymol these authors collected this parasite 16 times in 133 examinations. The validity of the species listed as possible synonyms, viz., *F. rathouisi*, Poirier; *F. goddardi*, Ward; *F. fulleborni*, Rodenwaldt; *F. spinifera*, Brown, 1917, is still a matter of controversy. Odhner considers *F. rathouisi* to be a synonym of *F. buskii*, as also does Leiper, while Railliet and Henry take the opposite view. It seems probable, however, that most of the slight differences that are supposed to exist between the various species are in reality due to variation in size,

and the degree of muscular contraction at the time of fixation, the latter by no means a negligible consideration when dealing with an active parasite of such large and fleshy proportions. The fact that the cuticle bearing the spines appears to be shed very readily during manipulation or in an unfavourable environment has also caused a certain amount of confusion as to the presence or absence of spines in this species. It is perhaps interesting to recall the observations of Barlow (1921): Barlow attempted to infect a pig by feeding three live flukes recovered from the fæces of a human patient, but the animal ceased to pass ova on the seventh day. The experiment was not repeated. He succeeded, however, in infecting himself in a similar manner. Out of a total of thirty-six flukes swallowed on five occasions, one apparently survived, to remain in the intestine for a period of thirteen months, finally to be removed by an anthelmintic.

Life History.—Nakagawa (1921) has succeeded in infecting snails, *Planorbis cœnosus*, Benson, and *Segmentina largillierti* in Formosa with the miracidia. He figures sporcyst, rediæ, daughter rediæ and cercariæ in the snail, and finds that the liberated cercariæ encyst on grass blades. Nakagawa infected a dog and two pigs with encysted cercariæ taken from clean snails which had been experimentally infected in aquaria.

Troglotremidæ, Odhner, 1914.

Paragonimus westermanii (Kerbert, 1878), Braun, 1899.

Synonyms: *Distoma ringeri* Cobbold, 1880; *D. pulmonale* Baelz, 1883; *D. pulmonis* Suga, 1883; (?) *Paragonimus kellicotti* Ward, 1908.

The history of the parasite has been excellently summarised by Baylis (1922). It will suffice in the present instance to recall some of the more salient facts. *P. westermanii* was originally described by Kerbert from the lungs of two tigers which had died in captivity in Europe. Shortly afterwards similar parasites from the lungs of man were forwarded by Manson to Cobbold, who described the parasite under the name *Distoma ringeri*. Lane (see Baylis, 1922) takes the view that *Paragonimus westermanii* and *P. ringeri* are identical, and points out that the supposed differences between them are based upon features subject to alteration by muscular contraction or methods of preservation. Perroncito (1913) claims that trematodes he found in the lungs of cattle in Italy, which were reported on by Rivolta (1868), were *Paragonimus*. According to an abstract (*Journal des Veterinaires du Midi* (1869), pp. 473–75), Rivolta states that the flukes found by

him in the cysts were furnished with cuticular spines directed backwards. In addition he refers also to two branches of the intestine stretching out over the body. If, as seems probable, Perroncito's claim is correct, this would be the first record of this parasite.

Ward (1908) proposed the name *P. kellicotti* for the species occurring in the pig, dog, and cat in North America, and later Ward and Hirsch (1915) stated that *P. westermanii*, *P. ingeri* and *P. kellicotti* could be differentiated by means of the shape and arrangement of the cuticular spines and by certain minor characters of the alimentary tract. Kobayashi (1918), however, considers these characters to be simply individual variations. This author states that there are no specific differences in the lung flukes from man, dog, cat, and pig in Korea. It is probable that the pig is the usual host of this parasite.

Paragonimiasis in man occurs chiefly in Far Eastern Asia, but infestation is common in pigs in North America.

The main points of the life history of the worm are known.

It has been shown by Japanese workers that it comprises two intermediate hosts: the first a snail and the second a crustacean. Kobayashi (1918) considers that one or more species of the genus *Melania* may act as the first intermediate host of the lung fluke. Nakagawa (1919) thinks that a cercaria discovered in May 1917 in the Shinchiku Province in *Melania libertina* is possibly that of the lung fluke. He thinks it likely that the cercaria found in Korea by Kobayashi (*loc. cit.*), and stated by Miyairi also to occur in species of *Melania*, is identical with his species. Miyairi, according to Nakagawa, has reported in Japanese that he has succeeded in obtaining this species experimentally by infecting *M. extensa* and *M. pannicicinca* with the miracidium of the human lung distome. He also expresses the view that Yoshida's cercaria " H " belongs to the same species. Nakagawa also describes an encysted larva in the crab, which he strongly affirms is the larva of the lung fluke.

Much of the work in the life history of *Paragonimus* has been published in Japanese and is only available through the extracts of Dr. Mills in the *China Medical Journal*. It seems almost certain that the first intermediate stage is passed in one or more species of *Melania*. With regard to the second intermediate host, various fresh-water crustacea appear to have been inculpated. Yoshida (1916) reports that he has found the encysted cercariæ in Japan proper in *Potamon dehaanii* (White) 40–70 per cent., *Sesarma dehaanii* (Milne-Edwards) 20–80 per cent., and *Eriocheir japonicus* 70–85 per cent. *Sesarma dehaanii* is not eaten by man, and therefore has little importance. Yoshida succeeded in infecting cats and dogs by feeding

with crab meat. Nakagawa (1916) lists the following as second intermediate hosts: *Potamon* (*Geothelphusa*) *obtusipes*, *P.* (*Geothelphusa*) *dehaanii* and *Eriocheir japonicus* in Formosa; *Astacus japonicus* in Korea; *Sesarma dehaanii* in Japan. His conclusions are supported by feeding experiments on dogs and cats. Kobayashi (1918) reports *Eriocheir japonicus* and *Astacus similis* as hosts in Korea. The fact that Nakagawa and Yokogawa (see Nakagawa, 1919) have decided that of the encysted cercariæ which were successfully transmitted by Nakagawa (1917) to dogs, some at all events were not those of *Paragonimus*, but of a new species (*Stephanolecithus parvus*), evidences the need for further elaboration and confirmation of the experimental side of this work.

In Venezuela, Iturbe (1919) has investigated the life history of this fluke, and lists *Ampullaria luteostoma* and *Pseudothelphusa iturbei* as the first and second intermediate hosts.

Hosts.—Pig, man, dog, cat, cattle, tiger.

Opisthorchiidæ, Braun, 1901 (*emend.* Looss, 1902).
OPISTHORCHIINÆ, Looss, 1899.
Opisthorchis felineus Riv., 1884.

Synonyms: *Distoma conus* Gurlt, 1831 [*nec.* Creplin, 1825]; *D. lanceolatum* von Siebold, 1836, von Tright, 1889, [*nec.* Mehlis, 1825=*Fasciola lanceolata* Rud., 1803]; *Distoma sibiricum* Winogradov, 1892; *D. tenuicolle* Muhl., 1896.

Opisthorchis felineus was described originally by Rivolta from the gall bladder and bile ducts of cats and dogs in Italy. The cat appears to be the natural host, but it is also found in the dog, the fox, and the glutton (*Gulo borealis*). It occurs over almost the whole of the continents of Europe and Asia. In East Prussia, Max Braun (1906) encountered it in 80 per cent. of cats examined, while Askanazy (1900) has recorded five cases in man in the same district. Winogradov (1892), by whom this species was first found in man, recorded nine cases in man from Tomsk, where this parasite alone was found to occur more frequently (6·45 per cent.) at post-mortem examinations, than all other parasites put together. Max Braun (1903) considered *Opisthorchis felineus* to be a fairly frequent parasite of man in the Heydekrug district of East Prussia, having himself observed five cases there in a few years. Verdun and Bruyant (1908), and others have recorded its occurrence associated with *Clonorches sinensis* in man in China. In Winogradov's cases more or less extensive changes in the liver had taken place, but in no case had the parasite been the cause of death. The numbers present varied from a few to several hundreds.

In two of the cases reported by Askanazy carcinoma of the liver had developed at the places most invaded by flukes. The flukes may invade the pancreatic ducts, and the small intestine also. According to Ciurea (1916), *Opisthorchis felineus* occasionally occurs in the pig, but the frequent abnormalities of structure displayed indicate that this is not a natural host relationship.

Life History.—Max Braun (1906) states that the eggs, which contain a ciliated miracidium at the time of deposition, only hatch when introduced into the intestine of *Limnea stagnalis*. Askanazy (1904) considers that *Dreyssena polymorpha* possibly acts as the first intermediary host. The latter author, by feeding experiments on cats and dogs, has established the fact that the second intermediary hosts are fishes, mainly the ide (*Idus melanotus*), but also the roach (*Leuciscus rutilus*). More recently Ciurea (1917) has proved experimentally that in Roumania the tench (*Tinca tinca*) also acts as secondary intermediary host. The encysted cercaria, which is enclosed in a thin hyaline membrane, is found in the subcutaneous connective tissue and musculature. The flukes mature, according to Ciurea, twelve days after the feeding of dogs upon fish containing encysted larvæ.

Hosts.—Cat, dog, man, fox, glutton (*Gulo borealis*), pig.

Intermediary Hosts.—First: unknown (see text). Second: ide (*Idus melanotus*), roach (*Leuciscus rutilus*), tench (*Tinca tinca*).

Opisthorchis pseudofelineus, Ward, 1901 [=*Distoma felineum* of Ward, 1895], occurring in cats in North America, appears to be a distinct species.

Clonorchis sinensis (Cobb., 1875), Looss, 1907.

Synonyms: *Distoma sinense* Cobbold, 1875; *D. spathulatum* Leuck., 1876 [*nec.* Rud., 1819]; *D. hepatis innocuum* Baelz, 1883; *D. endemicum* Baelz, 1883; *D. hepatis endemicum* Baelz, 1883; *D. hepatis perniciosum* Baelz, 1883; *D. japonicum* Blanchard, 1886; *Opisthorchis sinensis* Blanchard, 1895; *Clonorchis endemicus* (Looss, 1907).

This form was discovered in a Chinese by McConnell (1875) and named *Distoma sinense* by Cobbold. Various authors have considered that two separate species exist in man in the Far East, a larger one, *Clonorchis sinensis* occurring chiefly in China and a smaller form, *C. endemicus* widely distributed throughout Japan, Indo-China, and the eastern side of India. Of the synonyms listed above, *Distoma spathulatum*, *D. hepatis innocuum*, *Opisthorchis sinensis* refer to the larger form, and *Distoma hepatis endemicum*, *D. hepatis perniciosum*, *D. japonicum*, and *Clonorchis endemicus* to the smaller.

Verdun and Bruyant (1908) regard the two forms as varieties of the same species, and name them *major* and *minor* repectively. Looss (1907) and Braun (1893), however, considered these forms to constitute two distinct species. Kobayashi (1915) has shown that intermediate forms exist and that it is impossible in the case of large numbers of specimens to assign these to a definite species. He therefore considers that only one species, *Clonorchis sinensis* (Cobb.) occurs.

The flukes inhabit the liver, gall bladder, and bile ducts of man, dog, cat, and pig. In addition Kobayashi has succeeded in producing infection experimentally in the rabbit, guinea-pig, and rat. In man the presence of large numbers of *Clonorchis* is occasionally associated with carcinoma of the liver (Watson-Wemyss, 1910). It is rare in Europeans (Bell, 1912; Thibault, 1913), but extremely common in Orientals in certain districts. According to Katsurada 56–67 per cent. of the inhabitants are infected in the Province of Okayama. Leger (1908) at Tonkin found 54 per cent. infections in man in 300 examinations at Hanoi, while Gunn (1916) states that over 20 per cent. of the Chinese immigrants arriving at San Francisco are infected. Meyer (1916) found nearly 42 per cent. of infection in Chinese ships' crews.

Life History.—Kobayashi (1915) discovered the metacercariæ of this worm encysted in the musculature of fishes. He lists twelve species as harbouring the cysts, but of these by far the most important are *Pseudorasbora parva* (Schlegel) and *Leucogobio guntheri* (Ishikawa). Not uncommonly, the number of larvæ in a single specimen of *Pseudorasbora parva* may, he states, run to several hundred. A kitten to which six *P. parva* were fed was afterwards found to contain three thousand flukes.

With regard to the first intermediate host, Kobayashi ventured the opinion that *Melania libertina* was in all probability concerned. It has since been agreed, however, that the cercariæ found in *M. libertina* are commonly those of *Metagonimus yokagawai*. Muto (1918) discovered that *Bythinia striatula* var. *japonica* harbours three species of cercariæ, one of which encysts in *Pseudorasbora parva*. When dogs and mice were fed upon fishes experimentally infected in this manner infection with *Clonorchis sinensis* resulted.

Hosts.—Man, dog, cat, pig; experimentally, guinea-pig, rabbit, and rat.

Intermediary Hosts.—First: *Bythinia striatula.* Second: Fishes, *Pseudorasbora parva, Leucogobio guntheri, L. mayedæ, Sarchoc eilichthys variegatus, Pseudoperilampus typus, Paracheilognathus rhombeum, Acheilognathus lanceolatum, A. limbatum, A. cyonastigma, Abbottina psegma, Biwia zezera, Carassius auratus.*

METORCHIINÆ, Lühe, 1909.

Metorchis truncatus Rud., 1919.

Synonyms: *Distoma conus* Creplin, 1825 [*nec.* Gurlt, 1831 = *Opisthorchis felineus*]; *D. campanulatum* Ercolani, 1875; *Dicrocœlium lanceolatum* Mehlis, of Diesing.

This form inhabits the bile ducts and liver of the cat and dog in Eastern Europe. Its life history is unknown, but since Askanazy (1904) and Ciurea (1917) have shown that fishes act as the second intermediate host of a closely related species, *Metorchis albidus*, it is not unreasonable to assume that a similar life history holds for *M. truncatus*.

Max Braun (1903) considered that small flukes once observed in man by Winogradov (*loc. cit.*) and taken by him to be young forms of *Opisthorchis felineus*, might possibly have been *Metorchis truncatus*. Leiper (see Bagshawe, 1915), however, suggests that the spiny flukes in Winogradov's case actually belong to another, as yet undescribed, species of *Metorchis* which he has observed in dogs in China.

Hosts.—Seal (*Phoca vitulina*), (*Halichœrus fœtidus*), cat, dog, fox (*Vulpes vulpes*), glutton (*Gulo borealis*), man (?).

HETEROPHYIDÆ, Odhner, 1914.

Heterophyes heterophyes (Siebold, 1852), Stiles and Hassall (1900).

Synonyms: *Distoma heterophyes* Siebold, 1852; *D. heterophyes hominis* Diesing, 1855; *Dicrocœlium heterophyes* Weinland, 1858; *Fasciola heterophyes* Moquin-Tandon, 1860; *Heterophyes ægyptiaca* Cobbold, 1866; *Mesogonimus heterophyes* Railliet, 1890; *Cœnogonimus heterophyes* Looss, 1899; *Cotylogonimus heterophyes* Lühe, 1899.

According to Looss (1902) this fluke is common in man and the dog in Egypt. It is rarely found in the cat. Two cases in British troops were recorded by O'Connor (1916). Leiper (1913) has recorded cases in man from Japanese and Chinese crews entering the Port of London. It has also been recorded by Janson and Tokishige (1892) from the dog in Japan. *Heterophyes nocens*, according to Cort (1921) a new species, has been described by Onji and Nishio (1915) from man in Japan. Leiper (1922), however, states that a re-examination of material fron Chinese and Japanese cases has revealed no constant specific differences. These workers found that infestation could be produced experimentally by the feeding of raw fish, in particular, *Mugil cephalus*.

Hosts.—Man, dog, cat, fox (?).

Intermediate Hosts.—First: unknown. Second: *Mugil cephalus*.

Loxotrema ovatum Kobayashi, 1908 (*vide* Leiper, 1922).

Synonyms : *Heterophyes yokogawai* Katsurada, 1913 ; *Metagonimus yokogawai* Katsurada, 1913 ; *Yokogawa yokogawai* Leiper, 1913 ; *Metagonimus ovatus*, Yokogawa, 1913 ; *Loossia romanica* Ciurea, 1915 ; *Loossia parva* Ciurea, 1916 ; *Loossia dobrogiensis* Ciurea, 1915.

This parasite, discovered by Yokogawa in the small intestine of man in Formosa, was named *Heterophyes yokogawai* by Katsurada. According to Leiper (1922) *Loxotrema ovatum*, Kobayashi, 1908, is identical with *Metagonimus yokogawai*, Katsurada, 1913, so that the genus *Metagonimus* and its type *M. yokogawai* give place to *Loxotrema ovatum*. Ransom (1920) considers *Loossia romanica*, *L. parva* and *L. dobrogiensis* to be identical with each other and with *Loxotrema ovatum*. According to Ransom, Yokogawa has recorded the occurrence of this species in man, dog, and cat in Formosa, and has reared the worms to maturity in dogs and mice by feeding with fish containing the metacerceriæ. The usual host of the metacerceriæ in Formosa is a trout, *Plecoglossus altivelis*. In Japan, Katsurada (1913) has found the metacercariæ in *P. altivelis*, and less commonly in *Carassius auratus*, and *Cyprinus*. The flukes mature in the final host in from one to ten days.

Ciurea (1915) lists a number of fishes as intermediate hosts of the forms he has described from Roumania. These findings are supported by feeding experiments in dogs, cats and pigs.

Muto (1917) described a cercaria found in up to 50 per cent. of *Melania libertina* as the cercaria of *Loxotrema ovatum* and succeeded in infecting cats from fish (*Cyprinus*, *Carassius*) which he had previously infected with cercariæ from *Melania libertina*.

It had previously been suggested by Koboyashi (1915) that *M. libertina* most probably served as first intermediate host to *Clonorchis sinensis*, but the experiments of Muto proved that while cercariæ from *Bythinia striatula* gave rise ultimately to *Clonorchis sinensis* in experimental animals, those from *Melania libertina* were productive of *Loxotrema* only.

Distribution.—Japan, Korea, Formosa, Roumania.

Hosts.—Definitive. Man, dog, cat, pig, pelican (*Pelecanus onocrotalus*), mouse (experimentally).

Intermediary Host.—First : *Melania libertina* in Japan, Korea. Second : Fishes, *Plecoglossus altivelis*, *Carassus auratus*, *Leuciscus hacuensis*, *Cyprinus sp.* in the Far East ; *Scardinius erythrophthalmus*, *Abramis brama*, *Esox lucius*, *Carassius carassius*, *Aspius aspius*, *Idus idus*, *Blicca bjorkna*.

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DICROCŒLIIDÆ, Odhner, 1910.

Dicrocœluin dendriticum (Rud., 1819).

Synonyms : *Fasciola lanceolata* Rud., 1803 (*nec.* Schrank, 1790); *Dicrocœliun lanceolatum* Mehlis, 1825; *D. lanceolatum* Duj., 1845; *D. lanceatum* Stiles and Hassall, 1896.

The small lanceolate fluke of sheep is widely distributed throughout Europe and North and South America. It occurs also in the liver and bile-ducts of herbivorous and omnivorous animals in Siberia, Asia Minor, Turkestan, Algeria, Egypt, and North and South America, It has recently by Noel Pillers (1920-22) been recorded twice from sheep. in Great Britain. In man *Dirocœliun dendriticum* occurs perhaps even more rarely than does *Fasciola hepatica*. According to Cobbold (1864), cases have been recorded by Bucholz, Chabert (1852), Kichner. Aschoff (1892) records a case, while Zschokke (1892) states that Schiers has collected this parasite post-mortem from an Arabian in Alexandria. Galli-Valerio (1905) several times found the eggs of *Dicrocœluun dendriticum* during a systematic examination of human fæces in Villeneuve. More recently Mesnil (1916) stated that he had observed the eggs in the fæces of a Belgian officer returned from German East Africa.

Hosts.—Sheep, cattle, goats, deer, hare, rabbit, dog, pig, man.

Life History.—Leuckart considered that species of *Planorbis* (probably *P. marginatus*) served as intermediary hosts to *Dicrocœliun dendriticum*. His opinion was supported by some feeding experiments, of which confirmation is needed.

SCHISTOSOMIDÆ, Looss, 1899.

Schistosoma japonicum Katsurada, 1904.

Synonym : *S. cattoi* Blanchard, 1905.

This worm, the most recently discovered of the schistosomes occurring in man, was the first in which the life cycle was completely demonstrated.

Described by Katsurada (1904) from man and the domestic cat, it was the subject of numerous experiments by Japanese workers, who demonstrated the possibility of skin infection in man, cattle, horses, cats, dogs, mice, rabbits, and rats (Katsurada and Hashegawa (1910), Fujinama and Nakajinura (1912), and others). Comparison of the miracidia with the youngest forms obtained in the skin of experimentally infected animals showed Looss's hypothesis of direct infection with the miracidia to be untenable (Miyagawa (1912 and 1913), Matsuura and Yamamoto (1912), Fujinama and Nakamura (1912 ?) and others). Katsurada (1913) reported that he had been informed that Miyairi (Miyairi and Suzuku [1913]) had discovered the intermediate stages in a species of *Limnæa*. The snail was subse-

quently found to be a new species of *Blanfordia*, *B. nosophora* (Robson). Snails were infected with the miracidia of *Schistosoma japonicum*, and mice in turn infected through the skin by immersion in water containing cercariæ from the infected snails. These results were confirmed by Leiper and Atkinson (1915).

The cercariæ penetrate the skin usually through the hair follicles. Since they are quickly destroyed by gastric juice (Tsuchuga (1910) and others), infection by ingestion is not possible, but the cercariæ may, however, penetrate the mucous membrane of the mouth. The young flukes apparently reach the portal system by way of the blood-vessels, right heart and lungs, the majority, according to Narabayashi (1916) (see Cort, 1921), probably escaping from the lung capillaries into the pleural cavity and making their own way to the liver.

Hosts.—Man, cattle, horse, dog, cat.

Intermediate Host.—*Blanfordia nosophora* (Robson).

Schistosoma spindalis Montgomery, 1906.

This parasite, described by Montgomery (1906) from the zebu in India, is included here on account of the record of *Schistosoma* eggs in man at Madras by Stephens and Christopher (*vide* Fantham Stephens and Theobald, 1917).

These authors reported the finding of long spindle-shaped eggs unlike the eggs of *S. hæmatobium*.

It is not improbable that the eggs in question were those of *S. spindalis*, since in the case of *S. bovis* the eggs are of about the same length as those of *S. hæmatobium*, while those of *S. bomfordi* are a little shorter. The eggs of *S. spindalis*, however, measure about 0·25 mm. in length, or more than one-third as long again as those of *S. hæmatobium*.

Hosts.—Zebu (*Bos indicus*), man (?).

Life History.—The life history of this species has been worked out by Liston and Soparkar (1918), who recognised the cercaria in *Indoplanarbis exustus*, and were successful in transmitting the parasites to a goat by means of skin infection.

General Article

BUSINESS METHODS IN COUNTRY PRACTICE *

By E. V. MOORE,
Cortland, N.Y.

PRACTITIONERS as a class are the poorest business men in the land. If the average business man put in as hard work and long

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hours as a veterinarian does, watching his driving horse wade through the snow banks, doing a complete embrotomy in some well-ventilated barn on a zero night, removing a placenta or doing some equally entertaining or desirable job, he would be riding around in Packard enclosed cars. No professional class of men work as hard and as many hours for the net profit they receive as country practitioners. In a way, it is our own fault, because we simply don't know how much it costs us to do business.

I am not here to tell you that it is possible for a practitioner to make a lot of money, for that is even beyond any ordinary practitioner's expectation. It is like sending a refrigerator salesman to Alaska, to send a practitioner out into the world to pile up a lot of money; but we should as a class get our heads together and try to widen that much-talked-of gap between the cost of doing business and gross business, called profit.

What is meant by business? Newton says: "Business is any painful occupation in which profit is the goal and in which there is risk of loss." For instance, if a man is running a drug store for another man on a salary and commission, he is not in business. He is in business only when he himself takes the risk of losing money.

How much does it cost the average practitioner to do business? What part of every dollar does it cost you men to make that dollar? That is what I want to learn here to-day. What per cent. of our gross business should be eaten up by rent, office and hospital expense, drugs, transportation, collecting bills, paying collection agencies, and the thousand and one other expenses of the country practitioner? I want to learn this so that I may be better able to decide whether to buy more U.S.P. fluid extracts or more compressed tablets and dissolve them in tincture of tap water.

We have a system of keeping our expenditures, and I am going to tell you our plan with hopes of having many changes suggested so that our system will be much more efficient. Our system must not be too complicated, or we may neglect it, as the practitioner does not have much time to keep books; but I am sure some of us would get further ahead of the sheriff if we kept books better and rode less. We must ever remember that efficiency to a practitioner is the quickest and easiest possible way to get the desired results.

Every cent that goes out of our business is charged to one of three departments, and each department is kept independent of the others. We sometimes have to use our imagination considerably to tell where to charge an item, but we make it stay within one of these three departments:—

1. *Office and Hospital Department :—*
   Rent.
   Office help.
   Phones.
   Heat and light.
   Hay and grain for hospital cases, etc.
2. *Drugs and Material :—*
   Instruments.
   Drugs.
   Dressings, etc.
3. *Transportation :—*
   Cars.
   Tyres.
   Gas.
   Oil.
   Repairs on cars.
   Insurance on cars.
   Buying horses for transportation.
   Board money on transportation horses paid to office and hospital department.

We are doing business on about 45 per cent. of our gross business and have as our goal 33⅓ per cent. To do that, we must (our volume of business being the same) either cut down expenses of doing business or charge more for the work we do. The first department of our system will not need to be mentioned, as most of you men know better than I that it is necessary to keep after these little expenses around the office and hospital, and how they add up at the end of the year. The practitioner who does not keep track of these, and they are many, will be greatly surprised if he does for a year. For instance, the total on our office and hospital books from December 1, 1921, to June 1, 1922, is $1,083.47, and it would have been twice that if I had not known week by week how it was piling up.

The second department of our system, drugs and material. We all know that drug bills to the practitioner are like feed bills to our clients—always about twice as large as we thought they were. We keep a drug book and paste in every invoice under the space left for that particular drug house and under the month at hand. We can look up at once any invoice we ever had from any house this month, last month or last year. It is mighty handy in buying from a drug agent if you can tell him what you can buy so-and-so for from a competing house. It oftentimes makes the agents use considerable paper figuring out discounts that they never told you about before.

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Now as to buying drugs. You men know that there is no business in the world where the volume of business counts as much as in drugs. We buy all our basic things, like cotton, bandages, physics, capsules, oils, etc., for a year or more at a time. For example, I bought a case of 17 gross of B & B bandages at $4.87 a gross. We used to use Natol from Parke, Davis and Co. at $1.00 per gallon until we found out that the Standard Oil makes a white rose oil which is just as good if not better, and sells per 50 gallon barrels at 31 cents per gallon. We buy bottles from K. Steinfeld of Alden, and they beat their competitors by a long way ; on 32 oz. ovals over $4.00 per gross.

The third class, transportation. In the winter we buy horses when we need them and sell them as soon as possible in the spring, as the board from the time they would have to come out of pasture in the fall until the time we would need them, and the board from the time we would get through with them in the spring, would more than eat them up. This plan lets us buy them on a dull market in the fall or early winter and sell them on the high market in the spring. As for cars, we have gotten more miles on the dollar with Ford *coupés* than anything else we ever had, but there is a great difference of opinion as to the economy of different makes of cars.

The cost of running these cars is another thing that will surprise the man who does not keep track of them. The practitioner must realise what it costs to run cars, and that his fees must include this cost. Don't make your calls so cheap that they will use you like they did an M.D. in my town. A man came in his office one night who lived at Cuyler and wanted him to make a call at his farm. He said he would ride up with him, and as they neared the client's farm the client said: "Doctor, I suppose I owe you $5·00 as usual?" The doctor said yes, and he paid him, the doctor asking who was sick up here. The client said: "Oh, there is no one sick here; I broke my car and had to leave it in Cortland, and they wanted $8.00 to bring me home."

Now, with our system, at the end of every month, we add up our three departments, and we know how much it has cost us to do business that month. Now you men who do not know what it costs you to do business, just get a simple system and keep track for a month, and you will realise that a practitioner must get pretty good prices to make much profit.

We have seen where the money goes. Now, just for a few minutes let's go over where it comes from. We get pretty fair prices, more than most of the men around us, but in order to reach our goal of 33⅓ per cent. we must get more money for our work or do business on less money.

I want some of you men who have spent years in the business to get up here this afternoon and lead a discussion as to what the practitioner should charge. We get $1·50 for a city call with medicine extra. Our city calls average us $2·50 a call. For obstetrics, etc., in the city we get a minimum charge of $5·00 and add 50 cents a mile one way when we go in the country. For spaying, we get $5·00 from our country clients and $7·50 from city people.

The basis of our charges is based on what taxi-cab men charge, and our drugs and material. We charge for the material about what our client would have to pay for it at the drug store. That leaves us about 200 per cent. on most of our material. We used to have lots of kicking about our prices, but we have told our clients so many times that if we could not get taxi-cab men's prices, we would quit buying drugs, etc., and drive taxis, that our kicking has been practically eliminated. There are mighty few M.D.'s in our county that charge for visits what it would cost them to have a taxi take them there.

We would rather not make a call than make it at a loss or for nothing unless to some worthy person in hard luck. We made a rule this year not to book anything to a person that was not collectable. Of course we have not done that exactly, but have as far as possible. If we make a call to some deserving person that we know we probably will have trouble collecting, we do not enter it on our ledger at all.

We have learned who is who pretty well, and it cost us pretty well to learn in some cases. For instance, a man who has owed us for three years and could pay but never does pay anybody, called up one night and was refused service until he paid his bill. He said he never would pay the bill if we did not come out that night. I told him we might better buy him for $20·00 than for $26·00, which he would be owing us if we made the call. As for the man who holds us up and we never get our money, it is just like giving him a cheque for 45 per cent. of the bill. If a man owes us $100 and does not pay it, we might just as well have had him come in the office and we give him a cheque for $45 and never gone near his farm. A lot of the practitioners seem to think that if a man does not pay his bill, they just lose their time. They lose their time plus what per cent. of that bill it is costing them to do business.

These are atypical times in the agricultural world and collections are slow, but we have good clients, and the personnel is improving in direct proportion to our efforts on the collection end.

The practitioner should be a man in his community and belong to the organisations that are for the common benefit of his community,

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such as farm bureau, chamber of commerce, grange, etc., and to as many clubs and lodges as he sees fit in order to give him the rating of a business man of his community if nothing more. This will make him a lot of friends and build up a strong personality and reputation for him that is really his capital stock, and will draw him a high rate of interest from a business standpoint.

Newton says: "Personality is the energy and ability of manhood combined with the innocence and straightforwardness of a child." We all know that the practitioner as well as any other business man must do business on the level if he is going to do it long.

Now, in conclusion, I want to bring up again the points that we want discussed by you men. First, what percentage of a practitioner's gross business should it cost him to do business? Second, suggestions and ideas as to how to cut down the cost of doing business. Third, what fee should the country practitioner charge his clients?

(*The Cornell Veterinarian*, October 1922.)

REPORT OF THE DEPARTMENTAL COMMITTEE ON THE RECENT FOOT-AND-MOUTH OUTBREAK.

DURING the first nine months of 1922, some 1,125 outbreaks of foot-and-mouth disease occurred, involving the slaughter of 23,606 cattle, 21,710 sheep, 9,540 pigs and 48 goats, which cost the country in compensation alone (in addition to administration and other outlays) £790,244 5s. 1d., of which only £151,085 was realised in salvage.

The recommendations of the Committee for the future were:—

Maintenance of existing measures to prevent infection from abroad and prosecution in all cases of contravention.

Encouragement of local authorities to arrange for veterinary inspection at all important markets.

Animals landed from countries without Ministry's jurisdiction to be subject to six days' detention at destination to which these are removed from landing-place.

The Ministry should be responsible for disinfection costs, whether slaughter or isolation be adopted.

An amendment of the Act of 1894 conferring powers for dealing with the disease on the Ministry, but leaving the precise procedure to be settled in an Order of the Ministry.

The automatic service of a notice, upon a suspected outbreak on premises being notified, should define these as an "infected place" until withdrawn by the Ministry.

Subject, if necessary, to limitations as to numbers, specific authority should be conferred upon inspectors of the Ministry

to slaughter all animals affected at the time of diagnosis without reference to the Ministry.

A revised list of valuers, whose valuations would be binding on both parties, should be compiled, the selection of a valuer in each case lying with the Clerk to the local authority.

Provision should be made whereby, on the existence of foot-and-mouth disease being suspected by any veterinary inspector, the movement of animals within a radius of five miles of the premises wherein disease is suspected should be automatically prohibited.

Where the Ministry is satisfied that it can be done with safety, animals from infected places should be permitted to be removed to local abbatoirs for slaughter instead of being slaughtered under unsatisfactory conditions on farm premises.

The fifteen miles' radius of infected premises scheduled on confirmation should not be reduced, but the restrictions applicable to the outer portions should be relaxed at the earliest possible date.

Licenses for movement into a scheduled district for slaughter should be granted by the local authority of the destination.

All dogs should be required to be kept under control on roads in an area to which standstill restrictions are applied by the Ministry, and hunting prohibited during its continuance.

Conference between Ministry and Railway Companies as to adoption of revised standard of disinfection, more efficient, but not materially more costly.

Greater supervision over the cleansing and disinfection of markets.

Disinfection requirements should be made applicable in so far as possible to enclosures used for animals about to be or having been sold, and to lairs regularly used for the detention of cattle.

Local authorities should not be permitted to retain the general power of making movement regulations under the Order of 1895 in respect of animals moved into their districts from other districts in Great Britain.

The power of local authorities to make other regulations under the Order should be exercised only in respect of the geographical area of a county, and by a Joint Committee representing the county and burgh local authorities therein.

Local authorities should be reduced in number, and comprise (in Scotland) the counties and cities only.

Whole-time veterinary inspectors of local authorities should, subject to certain conditions, be made Inspectors of the Ministry in the respective areas.

The Ministry should remain the central administrative body throughout Great Britain.

A senior Inspector of the Ministry should be stationed in Scotland, whose duty it would be to keep in the closest touch with local authorities and agricultural bodies in Scotland, and advise them in all matters arising under the Diseases of Animals Acts.

Clinical Articles

THE BURDIZZO CASTRATOR

By GLADSTONE MAYALL, M.R.C.V.S.,
Bolton.

On looking over the literature of castration I find very little really informative about the castration of bulls and calves. There is much detail and copious writing explaining the means and methods used to emasculate the equine, but the beginner in calf and bull

Fig. 1.—The "Burdizzo Pincers" with the Piping Extension. Dr. Veglia.

castration, no less than in that of the ram and boar, has little to guide him. On big farms with plenty of animal attendants, and where clean straw can be had and a moderate degree of cleanliness is observed, the castrating of bulls and calves by opening the scrotum and using the knife, hot iron, ecraseur or torsion may be indulged in with a minimum of anxiety, but on little holdings and hill farms the conscientious veterinary surgeon often shudders at

the effects that may be produced in making open wounds on healthy animals. In the VETERINARY JOURNAL for November 1919 Mr. T. M. Inglis, M.R.C.V.S., J.P., had a very excellent article on " The Castration of the Bovine Male." He there describes the use, advantage, and procedure of castration by means of the Burdizzo. pincers. He states also that Mr. John Brown, F.R.C.V.S., of Invergordon, demonstrated the use of the instrument at the London College in 1913. Recently having some bovines to castrate, I wrote to Mr. Brown and Mr. Inglis about the castrator, and they were kind enough to send me lucid particulars as to its use. Mr. J. B. Russell

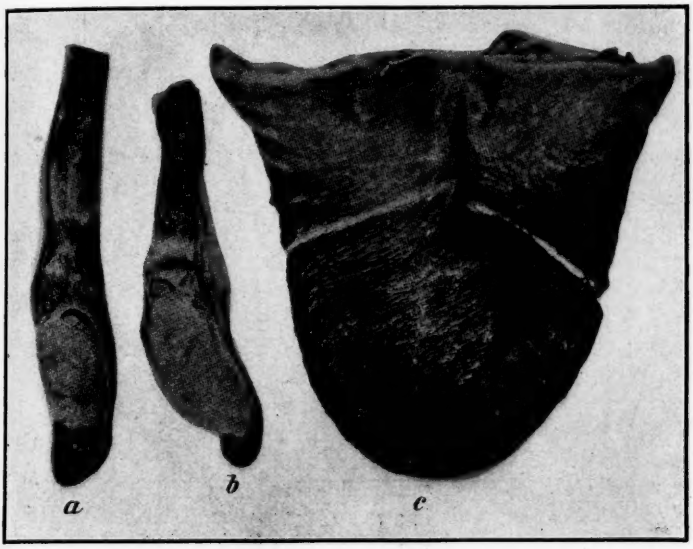

FIG. 2.

c. Testicular bag of a calf ten and a half months old, which was castrated with the pincers three months before its death.
a. Atrophied and dead testicle of same calf, compared with *b*, which is a normal size testicle from a calf one month old.
Dr. Veglia.

replied for Mr. Brown in his absence. Since then I have used the instrument, and find that it does its work satisfactorily and with a minimum chance of wound infection. Mr. Edward Morgan, F.R.C.V.S. of Puerto Cabello, Venezuela, when on a recent visit to me, stated that he had used the castrator, but found that the thick cords of some of the Argentine bulls slipped out from between the jaws of the pincers and were not effectually crushed. In some cases, as for instance in Brazil and the Transvaal, operators only appear

to give one crush to the cord. Both Mr. Inglis and Mr. Russell advise that each cord be crushed in two places. It may be that if this was done with the Argentine bulls the difficulty might be got over. There is no doubt that the cord needs well holding to the outside of the scrotum with a strong pressure of the fingers and thumb to prevent it slipping away from the action of the pincers.

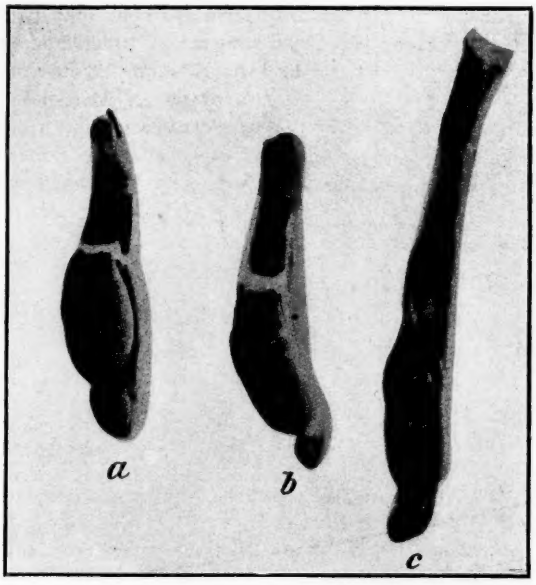

FIG. 3 ($\frac{3}{4}$ natural size).

a and *b*. Testicles of two calves one month old, which were operated on with the pincers. The pincers were closed on the scrotum, and no attempt was made to push up the cords, which on dissection showed to be completely severed.

c. Testicle of a calf ten and a half months old, castrated three months before death. The cord was found to be cut right through, leaving a gap half an inch wide.

Dr. Veglia.

For the benefit of beginners it may be well to quote Mr. Inglis's helpful lines to me, which coincide almost precisely with those sent by Mr. Russell :—

"Get an assistant to work the instrument. Your position has to be grasping the testicle and pulling slightly with one hand ; with the other force the cord tightly to one side, and keep a firm hold until the crushing is complete. When pressure is put on to the cord it is likely to roll out, and escape the injury that it is supposed

to get—that is the whole secret. You first do one side standing right behind and then reverse—make one crush right up the cord and then another about one inch below and quite near the testicle. Make sure not to place the instrument too far across the scrotum, as it may reach the other side, mark, and cause sloughing. Messrs. Inglis, Brown and Russell have done many bulls and calves, and are all satisfied with the instrument, but Mr. Russell says that in some bulls it is difficult to get the instrument to shut over the cords." It certainly needs some very hard pressure at times, and operators in South Africa have fixed longer handles on the instrument to enable this to be done. Dr. F. Veglia, of the Division of Veterinary Education and Research, Onderstepoort, Transvaal, in an interesting paper in the November issue of the *Journal of the Department of Agriculture*, Union of South Africa, gives a very good article on the use of the pincers. Some of the illustrations which we reproduce with full acknowledgment are very interesting.

Dr. Veglia says: "The technique of the operation is based upon the difference in resistance to pressure between the tissues of the scrotum and of the testicular cord. The skin of the scrotum and the fibrous membrane (*Tunica vaginalis*) containing the cords resist the pressure of the pincers while the bloodvessels and spermatic ducts of the cords are crushed and obliterated. The testicles are withdrawn in the scrotum immediately after crushing the cords. The reason is that the red muscular band which runs along the testicular cord is not cut by the pincers, and on contraction causes a sudden ascent of the testicles. Hæmorrhagic infiltration, degeneration of the testicles, and the conversion of the semeniferous tubules into fatty tissue then ensues, and eventually a small, hard irregular unit of fibrous tissue remains. The recommendation is made to push up the testicular cord as soon as it is severed by the pincers. When the pincers are closed on the scrotum the bag should be gripped above the clamps and the cord itself felt for with the first finger and thumb. On pressure the nails of the thumb and finger will almost meet, being separated only by the double layer of the skin of the bag. The cord should yield and go back about half an inch, so indicating that it is properly severed."

CASE OF COWPOX TRANSMISSIBLE TO MAN

By S. CODRINGTON, M.R.C.V.S.,
Chipping Sodbury.

Case 1.—A short time ago a farmer asked me to see his milking-cows, which, he said, were suffering from sore teats, rendering milking

a difficult job. When I arrived at the farm I found that I had cow-pox to deal with, there being five out of the eight of his animals affected; the three which were free being the first to be milked each day and standing in a different shed.

When I inquired for the farmer himself I was told that he had gone to see the doctor, as his hands had sores on them, and that the man who milked the cows had gone to the infirmary, where he was detained for treatment of a similar affection.

When I saw the owner the next time I went he had typical vesicles, some of which had ulcerated, on his hands and wrists, and he was constitutionally ill. I treated the cows and left plenty of disinfectants for the man to use after he had finished the milking, but it took between a month and six weeks for the whole affection to disappear from both man and cattle.

Case 2.—In another case which I have recently been called to the history was very much like that of Case 1. I was asked to treat the teats of four cows all of which were giving milk. The farmer had his hands bandaged and was under treatment by the doctor, and the interesting part is that as he could not milk the cows himself owing to the infection having been contracted in his hands, his younger daughter carried out these duties. She, however, did not contract the disease, and on making inquiries I was informed that she had recently been vaccinated, and that it had taken in the usual satisfactory way.

TWO ELECTRIC WIRE ACCIDENTS TO DOGS

By FREDERICK HOBDAY, F.R.C.V.S., and HAROLD STAINTON, F.R.C.V.S.,
Kensington.

An interesting incident of what might happen in any household where electricity is the lighting or heating power occurred a few days ago to a dog belonging to one of our clients. The patient was a small Pomeranian aged about eighteen months, and the history given by the owner is as follows:—

"I was sitting in my chair reading after lunch and I had arranged an electric lamp on the table at my side. The dog was lying on a chair just beyond the table. I had been reading for some little time when I heard a peculiar choking cry at my feet, and looking down I saw the little Pomeranian on her back with the lamp cord twisted around her paws and a part of it in her mouth. I snatched her up and disentangled her, and with the aid of my maid I rubbed her vigorously all over the body and shook her; but she was quite cold

and limp, and her eyes appeared lifeless. Froth was oozing from her mouth and she was apparently quite unconscious. I took her outside into the air, still shaking her vigorously. Quite suddenly a feeling of life returned to her body, and I found to my great relief that in a few minutes she was able to stand, and presently even to walk a few steps. Her recovery after this was rapid. Upon examining the wire connecting the electric lamp with a plug in the wall, I found that it was exposed in one place where she had bitten away the covering. Our voltage in this district is 100."

As these are accidents which have not been frequently observed, but might easily happen, they are worthy of being placed on record.

A similar case had happened about two years ago, the patient in this case being also of the toy variety. The animal had gnawed through a wire attached to a plug in the wall, and the shock it received caused almost identical symptoms to those recorded above. In this instance, too, the dog became unconscious from the shock, but eventually made a good recovery.

DEATH OF A PUPPY FROM EATING LINSEED CAKE

By T. G. HEATLEY, O.B.E., F.R.C.V.S.,
Woodbridge.

A SPANIEL puppy, when out at exercise with the owner, found some linseed cake in a barn and ate it at about three o'clock, arriving back at its kennel at about 4.30 p.m. At six o'clock a groom found the dog in a state of coma, and it was brought to me at about 7 p.m. The animal was then comatose, and died at ten o'clock.

The symptoms shown in addition to the coma were that the animal had three or four convulsive fits, the mouth being held wide open and the angles pulled back ; respirations became very shallow about an hour before death.

Post-mortem revealed a mucilaginous mass in the stomach, agglutinated together so firmly that it was difficult to break it up. It weighed 1½ lb. Whether death was due to acute indigestion produced by this solid mass, or whether to linseed poisoning, I am not prepared to state; possibly both contributed somewhat to the fatal result.

Abstracts of Current Literature

F. Hendrickx.—Concerning Doping.—*Annales de Médecine Vétérinaire*, October, 1921, p. 401.

INTRODUCED from America into our training stables, doping is a practice that consists in the administration, in whatever manner, to race-horses of drugs capable of producing an artificial stimulus of such an intensity as would be impossible to effect in normal conditions. Doping does not constitute a method of training. The methodical and progressive use of therapeutic agents is permitted during the training period, but their abuse by certain persons for dishonest and immoral gain ought to be forbidden. Moreover, doping compromises the health of the animals, and above all alters their reproductive power.

The principal drugs used for doping are: heroin, strychnine, caffeine, morphine, cocaine and atropine. These agents act each according to their well-known therapeutic properties, all producing in a more or less pronounced degree excitation of the central nervous system, and as a result an acceleration of muscular contraction going as far as tetanisation, and at the same time hyperactivity of the cardiac functions.

To recognise in a certain way that a horse has been *doped*, it is necessary by chemical analysis to put in evidence the presence of the alkaloid in the products of excretion. Thus Professor Kaufmann has been able to detect the presence of alkaloids in the saliva of doped subjects.

When does elimination commence and how long does it last? Bru and Robert have shown that morphine may be detected in the saliva half an hour after injection, heroin after forty-five to sixty minutes, cocaine after half an hour, and that elimination was complete at the end of three days for the two first alkaloids and at the end of twenty-four hours for cocaine.

From these experiences it may therefore be concluded that it is possible to affirm that when chemical analysis reveals the presence of alkaloids in the saliva these have been administered in the three days which precede the collecting of the saliva. Or legally it is not possible to defend an owner who administers an alkaloid to his horse during a period of training.

It is necessary, therefore, to take measures so that the good faith and honour of owners may not be attacked or impugned. To achieve this double aim, this principle may perhaps be admitted: "Shall be considered as having been doped any horse which shows

on chemical analysis the presence of an alkaloid in the saliva at the time of the race."

In this way owners who do not wish to expose themselves to any suspicion of doping will cease the administration of all drugs three days before the horse runs its race.

Douville.—On the Diagnosis and Nature of Cutaneous Ulcerous Lesions in the Cat.—*Revue Vétérinaire*, No. 4, April, 1922.

PROFESSOR DOUVILLE had an eighteen-months-old cat brought to him with an ulcer on the side of the face which under treatment showed no tendency to heal. He suspected that it was tuberculous, and tested the cat with tuberculin and also examined the discharge microscopically for tubercle bacilli. The cat did not react and no tubercle bacilli were found. Experimental animals, however, showed typical lesions of the serosa and spleen after inoculation. A month later the cat's hock swelled and fistulas formed, and as in man there was rapid tuberculosis of the joint and tendons. Autopsy revealed evident tuberculous lesions in the spleen and abdominal glands, caseous nodules in the hock, with the astragalus divided into two fragments. Douville stresses the importance of diagnosing tuberculosis in the cat, but says she acts very badly or not at all to tuberculin. He mentions other skin affections of the cat that he has observed (and we can confirm his observations). These are papulo-erosive erythema, sarcoma, epithelioma and mammary neoplasms.

As regards the treatment of papulo-erosive erythema which is more annoying than serious, clip the hair around the papules and rub them with a tampon soaked in alcohol at 60°, and thereafter strew on the following mixture:—

Boric acid	5 parts
Salol	2 parts
Zinc oxide or bismuth subnit . . .	20 parts

Besnoit, C., and Robin, V.—Contribution to the Clinical Study of Avian Tuberculosis (Diffuse Osteo-periostitis without Visceral Localisation).—*Revue Vétérinaire*, December, 1922.

THESE authors give an account of tuberculosis present in the bones of a fowl which showed no trace of lesions in the viscera. The fowl did not react to the tuberculin test, but experimental animals died after inoculation with all the symptoms of tuberculosis. The pus in the affected articulations contained tubercle bacilli in abundance. The works of Alamartine and Ball, Cadiot and Ball and Auger, tend

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to identify diffuse osteo-periostitis of the dog with the hypertrophic pneumonic osteo-arthritis of man, and the experience of the authors in this case shows that tuberculosis of birds, like that of mammiferæ, may be manifested by diffuse osteitis. An inoculated rabbit developed quite similar osseous lesions to those of the affected fowl showing the great receptivity of the articulations of the rabbit for the microbes and their toxins, a fact long ago noted by Dor, who considers the sub-acute arthritis produced as analogous to the white tumours of man.

Ball and Lombard. — Primitive Progressive Myopathy. — *Revue Vétérinaire*, No. 10, October, 1922.

THESE authors describe an interesting case of this malady in an eight-year-old bitch. The subject was emaciated, with little appetite for food. At different periods it had shown digestive trouble, exhibited by vomiting and diarrhœa. For some months the owner had noticed progressive weakness of mobility and atrophy of the muscles of the posterior region of the body. Later on walking became difficult, and the ailing bitch would sink down behind. Going upstairs was a matter of much difficulty. The bitch was destroyed.

Histologically there were adipose cells in the muscular tissue and general atrophy of the fibres. The condition is said to be due to the transformation of striated fibres into a series of adipose cells. It is a malady that has often been recorded in man, and several forms of it have been noted affecting the arms, legs, sacro-lumbar muscles, etc. In veterinary practice it has chiefly been seen in calves. Piettre found it in 20 calves out of 10,000 examined. Professor Basset described a case in a calf in 1904 in *Bulletin de la Société anatomique de Paris*, and again in 1905. It is an interesting complaint, and all the more so as it is common to men and animals. Its pathogeny has not been elucidated. In human medicine there are two theories: first that it is a purely muscular affection due to a defect of muscle nutrition, and second that it is due to a functional derangement of the marrow; and from this Erb considers it to be a *muscular trophoneurosis*.

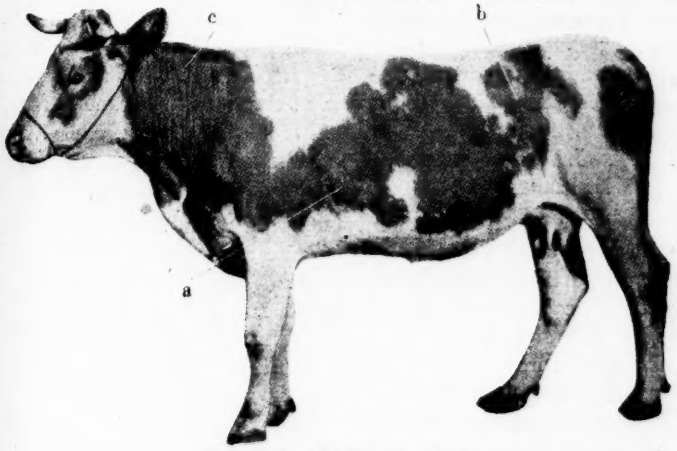
Bach, E.—Alopecia in Cattle.—*Schweitzer Archiv für Tierheilkunde.*

THE complete or total loss of hair in cattle is not frequently observed, so I will give a short account of three cases that occurred in my practice.

In the winter of 1918–19, a well-nourished cow suddenly showed a staring coat and slight rise of temperature, due to indigestion. But she was quickly right again except that a few days afterwards she showed little hairless patches on the upper part of her thigh.

Within a month the hind-quarters and limbs were quite devoid of hair, and only the fore-quarters and head were normally covered with hair. Drugs were useless. This condition lasted until the autumn, when the hairy coat was slowly replaced. The cow is still alive and shows no longer any trace of this illness.

A second case occurred in the year 1917 in a mottled grey cow. Without any visible cause the dark hairs fell out completely, so that the pigmented parts of the skin were completely bald. This condition lasted for a year and then became normal again, but during this time the cow showed a very comical appearance.



a, b, and c, the hairy portions.

In a third cow which I photographed the bald spots were limited to single spots. A hairless place on the left side of the chest was very distinctly heart-shaped. The causes of this alopecia are obscure (it is generally ascribed to a trophic neurosis, and in dogs we have had good results from internal administration of iron and iodide of arsenic, and the application of coconut oil to the skin—TRANSLATOR), and the therapy rather futile. Natural recovery may occur. Generally, such an animal is conspicuous by its comical appearance, and the owner gets disgusted and has it slaughtered.

Macfie, J. W. S.—Observations on the Rôle of Cockroaches in Disease.—*Ann. Trop. Med. and Parasitol.*, vol. xvi. p. 441.

THESE insects, according to Morrell (1911), are able by contamination with their fæces to bring about the souring of milk, to infect food and milk with intestinal bacilli, to transmit the tubercle bacillus, to disseminate pathogenic staphylococci, and to transmit destructive

moulds from place to place. Longfellow (1913) found that they carried various harmful organisms on their limbs and passed them in their fæces, and considers them as bad as flies for carrying infection. The material which it was desired a cockroach should eat was offered to it smeared on bread. Extensive experiments were conducted in this connection, the species of cockroach employed being *Periplaneta americana*, L., and the object of the tests was to see what organisms the cockroach would pass unharmed through its intestine. None of the organisms used in the experiments were found to exist as parasites in the intestines of the cockroach. They passed out unharmed tubercle and leprosy bacilli and entomœban cysts, also various eggs of intestinal worms; but typhus, para-typhus, and dysentery bacilli were not recovered in the fæces after experimental feeding. Apparently, then, cockroaches may aid in the spread of certain diseases and parasites.

Lacroix, J. V., and Cozart, J. M.—Hysterical Manifestations of Canine Distemper.—*North American Veterinarian*, January, 1923.

A PRELIMINARY report of twenty-four cases of the above deals with cases of hysteria symptoms quite similar to those that have been troubling many veterinarians in these Isles during this last year. The symptoms are restlessness lasting sometimes for forty-eight hours, suddenly developing into pure hysteria. Subjects bark or howl, pupils are dilated, bodily functions as in exertion and excitement, and attacks succeeding one another at hourly intervals unless the patients are disturbed. There is no champing of the jaws, and saliva and air are not worked up into a foam as occurs in epilepsy or chorea-like spasms. After attacks dullness follows, but recovery takes place with no post-hysterical derangement.

As *treatment* the authors recommend avoidance of useless medication and molestation of affected subjects, quietness and seclusion, and a small (desensitising) dose of distemper serum followed in twenty-four hours by a full dose of serum with bacteria. Autogenous bacterin seems very useful. Careful attention to diet, good nursing, tonics and cod-liver oil are also recommended.

The conclusions arrived at by L. and C. are:—

1. Both males and females are affected.

2. About 75 per cent. recovered or were practically well when this report was compiled.

3. With few exceptions, cases manifested clinical symptoms of distemper, immediately preceding, during or soon after the hysterical attacks.

The authors believe that—

1. They are dealing with a malady that is distemper, manifested

in a form which one does not usually see. It is not the result of faulty diet, intestinal parasites, nor of other causes mentioned by some.

2. It is a pure hysteria that precedes, accompanies or succeeds distemper of young dogs. It is also seen in dogs having had distemper previously, where such animals have recently been in contact with distemper-affected dogs, or with contaminated kennels.

3. Dogs that have had distemper contract and later manifest this affection less readily than do those not having previously had distemper.

4. It is a mild type of the nervous form of distemper manifested in a fashion that is new to us.

5. The term " distemper " is used here as being applicable to the " disease of young dogs," and includes all of the complications ordinarily considered as " distemper of dogs."

6. If this were a " new disease " it would be difficult to explain its frequent association with distemper in many homes where dogs do not come in contact with others of their kind—away from veterinary hospitals and kennels. For instance, it is seldom that one observes influenza and tetanus at the same time in horses. Dissimilar affections are found to coexist in the same subject only rarely.

Cure of Follicular Mange in the Dog.—*La Clinica Veterinaria.*

It has long been acknowledged that it is doubtful if follicular mange in the dog can be cured. In fact the many treatments which have been adopted, and the four which profess to be of any use, show the extreme difficulty which exists, in treating with any chance of success this obstinate disease.

The great difficulty consists in not being able to attack the parasite, as it burrows down into the follicles and into the sebaceous glands. This is not the only obstacle which is opposed to successful treatment, as the sebaceous matter goes a long way to neutralise the effect of any ingredients which may be applied to the skin. I will here give a treatment which has proved successful in curing dogs affected with this disease :—

Brush and wash thoroughly every day all over with tepid water, soap and creolin, rub and dry with cotton-wool bathed in ether ; rub well a second time with iodised ether (" etere-iodico " 102 per cent.). Only in ether, in chloroform, and in benzine can be dissolved the sebaceous matter, and this opens up the way to the hair follicles. Amongst the solvents we have given preference to ether for its cooling effect on the skin, and for its poisonous action on the ascarides.

The violent rubbing sometimes causes the skin to become slightly tumefied.

If the malady is diffused over the whole body, the dog must not be dressed all over at one time; a fourth or fifth part had better be treated, so as to prevent the ether causing any general constitutional disturbances. Many applications are often necessary, but generally the case continues to improve; especially is this so in the squamous form. More patience is necessary in the pustulous form of the disease, but the dissolving action of the ether and of the "etere-iodico" do not long delay in giving good results in the treatment of follicular mange, even in the most diffused and inveterate cases.

Stephens, J. W. W., and Yorke, W.—Sleeping Sickness (T. Gambreuse). *Annals of Tropical Medicine and Parasitology*, December, 1922.

A CASE successfully treated by "Bayer 205" is described, the details being as follows:—

The patient was infected in Northern Nigeria in August, 1921, and had no treatment until he arrived in England in March, 1922. When seen in Liverpool trypanosomes were found in the blood and gland juice. He was given subcutaneous injections of atoxyl, followed by novarsenoblon administered intravenously, and under this initial treatment he improved. On May 28th trypanosomes were still present in the blood. On May 30, June 1 and 3 an injection of "Bayer 205" was given intravenously, and four subsequent examinations of the blood were negative. On June 27th an intravenous injection of "Bayer 205" was given as a prophylactic, and the patient has remained in good health since. This is the second case of sleeping sickness recorded in this journal as cured by "Bayer 205." Yorke described the first one in the *Annals of Tropical Medicine and Parasitology* in vol. xv. p. 479. Much investigation has been conducted into this disease since H. G. Guinness and Sir. P. Monson first laboured on it in 1891, and it is gratifying to know that at last a cure seems to have been found for it.

Adler, J., and Clark, E. J.—Intra-Uterine Infection with "Ancylostoma Caninum" in Dogs.—*Annals of Tropical Medicine and Parasitology*, December, 1922.

INTRA-UTERINE infection with hook-worms has been noted by Howard (1917), who found ova in the stool of a child fourteen days old.

Owing to lack of human material, a number of young animals were examined in order to find whether intra-uterine infection with hook-worms is a common occurrence.

Thirteen young dogs (from two to fifteen days old), representing

eight different litters, were examined for ancylostomes. The results were as follows :—

Litter.	Age in Days of Dogs.	Number examined.	*A. caninum.*		Remarks.
			Worms.	Ova.	
1	2	2	negative	negative	
2	5	2	negative	negative	
3	5	2	positive (2)	negative	One infection was intense. Ancylostomes up to 7 mm. long with well-developed buccal capsules. No ova in the uteri of the worms.
4	7	2	negative	negative	
5	13	1	positive	positive	
6	14	2	positive (2)	positive (2)	
7	14	1	negative	negative	
8	15	1	positive	positive	

It thus appears that in Freetown, where intense infections with *A. caninum* are the rule in dogs, intra-uterine infection is common.

It is noteworthy that, although infection with *A. ceylanicum* is common in adult dogs, we have not found evidence of intra-uterine infection with this parasite.

Infection of the fœtus is possible in two ways :—

(1) By larvæ passing through the maternal blood-stream to the placenta, and through the placenta to the fœtus.

(2) By larvæ finding their way into the peritoneal cavity of the mother and passing through the uterine muscle to the placenta.

Yoshida (1920) has shown the possibility of this by observing ancylostome larvæ in the peritoneal cavity of experimentally infected guinea-pigs ; and we have found ancylostome larvæ in the peritoneal cavity of a guinea-pig which had been placed for ten hours in a vessel containing a mixed culture of *A. caninum* and *A. ceylanicum*.

Lutz. — Congenital Diaphragmatic Hernia in the Dog. — *Berliner Tierärztliche Wochenschrift,* June 22, 1922.

A SHEPHERD'S dog, nine months old, had been bought without a guarantee and with a veterinary certificate saying that the dog "did not present any symptoms of illness at the moment."

The owner noticed that the dog remained thin notwithstanding very regular feeding, and that he did not lie down after a meal and that he rose up immediately after trying to lie down.

Suddenly eight weeks after purchase the dog became seriously ill after bolting his meal, and died on the arrival of Lutz, who noticed very intense and irregular beats at the middle height of the chest.

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Autopsy.—On opening the left side Lutz was surprised to find the liver displacing the heart. The heart was lodged in an indentation of the superior edge of the liver, the point being turned to the left. The stomach in great part was in the pectoral cavity. The epiploon was adherent to the anterior face of the diaphragm. The left pulmonary lobes were greatly retracted and were in the interior part of the thoracic cavity. The diaphragm showed an oval opening six inches long and three inches wide. The edges of the opening were rounded, smooth, without hæmorrhages or remains of effused blood. Death was due to strangulation of a loop of intestine between the stomach and the hernial rim (hernial ring anæmic and inflammation of the strangulated loop).

The diaphragmatic hernia was congenital. Besides the symptoms observed by the owner (transient digestive trouble, discomfort on lying down) there was probably respiratory difficulty which had not attracted attention.

In human practice complete absence of the diaphragm has been observed in children, and they have lived for some years, but as a rule those affected as in this case die soon after birth.

Cases we meet in Daily Practice.

NOTE what the heat will do to a man :—

" Where is the inducement for a young man to take up the study of veterinary medicine ? We can see by reports that there was a small entry in 1920. Is it any wonder ? The cost and requirements are too great, and I want to say if they could get a glimpse of an actual country practice, such as removing decayed placenta, a fœtus that has been dead for several days until a slippery, filthy mass, or remove the remains of one that has been carried in the uterus for six months,—if they would brush up against a few of these I imagine they would cry, ' Oh mamma, deliver me ! ' then after washing in many waters still have that pregnant odour. Oh, it's simply fine, it is only the odour of the country veterinarian, and it only takes ten years of hard study and a small fortune to get the privilege of doing the job. Go to it, boys. I will say there is a certain number who get fairly good positions, but these are not for the common lad. It is amusing to see the ones wanting jobs in serum plants. Well, I will ring off, with best regards to all the boys.—ONE OF THE GANG."

I am indeed sorry for this man. He probably wrote this article during the dull summer months while waiting for the 'phone to ring or after receiving his garage bill. My work has not been a continual round of removing placenta or emphysematous calves. I have had a great deal of pleasure mixed in. The past year has been unusual

in all professions, but I believe that all we need to do to make the veterinary profession as good as any is to do careful, conscientious work, charge a decent price, and just keep on keeping on.

F. C. CLARK.

(*The Cornell Veterinarian*, October, 1922.)

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DR. A. STANLEY GRIFFITH requires material from cases of tuberculosis in horses, for the purpose of studying the bacteriological characters of strains of equine tubercle bacilli.

Will veterinary surgeons who are willing to co-operate kindly forward the specimens to the Field Laboratories (University of Cambridge), Milton, Cambridge?

The material must be sent fresh without preservative, accompanied by a short *précis* of the *post-mortem* findings.

Specimen bottles will be provided (or returned), and postal expenses defrayed.

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